



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Kaitlyn L. Lee	Project Number 35745
Project Title Reach for the Roots	
<p align="center">Abstract</p> <p>Objectives/Goals The objective is to see if the roots of a plant grow in the direction of gravity, even if the seeds are turned upside down or lying flat.</p> <p>Methods/Materials Six seed cases were built. Each consisted of four seeds on top of a wet, folded paper towel in the corners of the CD case. Then, the outside of the case was labeled up, down, left, and right. Next, two CD cases were placed upright, two were lying flat, and the last two started upright, but were rotated 90 degrees every two days. All six CD cases were placed in a lightproof cardboard box. The roots would be measured by the use of string and a ruler at the end of each week, but would be continually watered every day. I would also observe the direction the roots were growing towards at the end of each week based on the angle they were positioned at.</p> <p>Results During the second to third day of my experiment, my seeds started to sprout roots. At the end of week one, CD cases three and four had roots at the length of ten to eleven centimeters long. CD cases one and two were nine to ten centimeters long and CD cases five and six were shorter in length at four to five centimeters long. During the second week, the roots from CD cases one and two grew longer than the roots of CD cases three and four. It stayed this way until the end of the experiment. However, all the roots germinated towards the direction of gravity. After every week, each of the CD cases# roots increased in length, but they still grew in the direction of gravity.</p> <p>Conclusions/Discussion At the end my experiment, I came to the conclusion that the roots of a plant always grow in the direction of gravity. This can be from the concept of gravitropism which takes place with the three stages of: perception, transduction, and response. I believe this is the main reason why not only roots develop in the direction of gravity, but why all living organisms mature in the direction of gravity.</p>	
Summary Statement My project is about how the roots of a plant grow responding to a change in the direction of gravity.	
Help Received	